

Patent claims

1. A method for the closed-loop control of a thermostat (11), in particular in a cooling circuit of an internal combustion engine (1), wherein, by means of the valves in the thermostat, a small coolant circuit without a radiator (2) and a large coolant circuit with a radiator (2) can be separated from one another or connected to one another in a temperature-controlled manner, or connected to one another in a mixing mode with a mixing ratio with closed-loop control of the temperature, and the operating units of the valves in the thermostat (11) are triggered by a control means (5), and one of a plurality of possible desired coolant temperatures is set by opening and closing the valves in the thermostat,

characterized in that closed-loop control to each prespecified desired coolant temperature involves a first and second closed-loop control phase, with the first closed-loop control phase in the form of basic adaptation (40) with stored control parameters setting the currently prespecified desired coolant temperature as quickly as possible, and, after the respectively current desired coolant temperature is reached, the second closed-loop control phase in the form of fine adaptation (41) with variable control parameters keeping the currently prespecified desired coolant temperature as constant as possible.

30

2. The method as claimed in claim 1, characterized in that, when the currently prespecified desired coolant temperature is changed, the new desired coolant temperature is set by fine adaptation.

35

3. The method as claimed in claim 1 or 2,

characterized

in that the basic adaptation settings are improved by the corrected fine adaptation settings.

5 4. The method as claimed in claim 1 or 2,
characterized

in that, when the motor vehicle is started, the basic adaptation settings are matched to the ambient temperature.

10

5. The method as claimed in claim 4,
characterized

in that, when the motor vehicle is started, the basic adaptation settings are adapted if the ambient
15 temperature has changed at least by a prespecified temperature interval and the motor vehicle has been out of operation for a prespecified minimum period.

6. The method as claimed in claim 1,
20 characterized

in that the current desired coolant temperature (TMSoll) is selected from amongst three different prespecified desired coolant temperatures as a function of the load.

25

7. The method as claimed in one of claims 1 to 6,
characterized

in that the external air temperature (33) is also entered into the closed-loop control system in the
30 first and in the second closed-loop control phase.

8. The method as claimed in one of claims 1 to 7,
characterized

in that basic adaptation (40) can be deactivated and,
35 particularly in the event of a fault, closed-loop control of the coolant is taken over from a redundant fallback level by a proportional controller (43).